

What is claimed is:

1. A sparger adapted for placement within a duct, the duct having a first fluid flow substantially parallel to a longitudinal axis defined by the duct, the sparger
5 comprised of:

a housing having an interior chamber for receiving a second fluid flow having an associated pressure higher than the first fluid flow wherein the housing is shaped to have an aerodynamic profile as encountered by the first fluid flow; and

a plurality of fluid passageways formed by the housing to allow the second
10 fluid flow to pass through the chamber to enter the first fluid flow at a decreased pressure.

2. The sparger of claim 1, wherein the housing is comprised of a plurality of stacked disks aligned about a central axis of the stacked disks.

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3. The sparger of claim 2, wherein each disk is selectively positioned in the stack of disks to form the fluid passageways, each disk having (a) fluid inlet slots partially extending from a hollow disk center towards a disk perimeter, (b) fluid outlet slots partially extending from the disk perimeter towards the disk center, and (c) at
20 least one plenum slot extending through the disk to enable fluid flow from the fluid inlet slots in one disk to the plenum slots in adjacent disks and to the fluid outlet slots in at least one disk, wherein the fluid flow path is split into a plurality of axial directions along the central axis, then into the plenum slots with a plurality of lateral flow directions, and then distributed through multiple outlet slots in at least one disk.

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4. A sparger according to claim 3, wherein the plenum slot in the adjacent disk also enables fluid flow from the fluid inlet slots in one disk to be coupled to multiple fluid outlet slots in respective disks in the stack adjacent to the adjacent disk.

5 5. The sparger of claim 2, wherein each respective fluid passageway is comprised of a tortuous flow path with each tortuous flow path remaining independent from each other in traversing through the disk.

6. The sparger of claim 3, wherein the fluid inlet slots and the fluid outlet
10 slots are formed within a flow sector and the plenum slot is formed a plenum sector wherein the flow sector and plenum sector are joined to form an individual disk.

7. A noise abatement device for turbine bypass in air-cooled condensers comprised of:
15 a plurality of spargers adapted for placement within a duct having a first fluid flow, the first fluid flow being substantially parallel to a longitudinal axis of the duct;
 at least one of the plurality of spargers comprising a housing having an interior chamber for receiving a second higher pressure fluid flow such that the housing forms a plurality of fluid passageways to allow the second fluid of higher pressure to flow
20 through the chamber and enter the first fluid flow within the duct at a decreased pressure; and

 the at least one of the plurality of spargers being shaped to have a profile to substantially reduce the aerodynamic resistance of the spargers.

8. The noise abatement device of claim 7, wherein the housing of each sparger is comprised of a plurality of stacked disks aligned about a central axis of the plurality of stacked disks.

5 9. The noise abatement device of claim 8, wherein each respective fluid passageway is comprised of a tortuous flow path with each tortuous flow path remaining independent from each other in traversing through the disk.

10 10. The noise abatement device of claim 8, wherein each disk is selectively positioned in the stack of disks to form the fluid passageways, each disk having (a) fluid inlet slots partially extending from a hollow disk center towards a disk perimeter, (b) fluid outlet slots partially extending from the disk perimeter towards the disk center, and (c) at least one plenum slot extending through the disk to enable fluid flow from the fluid inlet slots in one disk to the plenum slots in adjacent disks and to
15 the fluid outlet slots in at least one disk, wherein the fluid flow path is split into plurality of axial directions along the central axis, then into the plenum slots with a plurality of lateral flow directions, and then distributed through multiple outlet slots in at least one disk.

20 11. The noise abatement device of claim 10, wherein the fluid inlet slots and the fluid outlet slots are formed within a flow sector and the plenum slot is formed within a plenum sector wherein the flow sector and plenum sector are joined to form an individual disk.

12. A method of reducing the aerodynamic resistance within a turbine exhaust duct having a first fluid flow, the method comprising the steps of:

fashioning a sparger with a housing having an interior chamber, the housing forming a plurality of fluid passageways for receiving and transferring a second
5 higher pressure fluid flow into the first fluid flow at a controlled rate wherein the housing is shaped to have an aerodynamic profile as encountered by the first fluid flow; and

mounting the noise abatement device comprised of at least one sparger within a turbine exhaust duct, the noise abatement device being generally symmetrically
10 situated within the turbine exhaust duct.